

Welcome to the Alaska Exotic Plant Management Team Data Collection Protocol for 2005!

This document is intended to guide you through the process of exotic plant management data collection using Trimble GPS units and a customized Data Dictionary. It is also intended to maintain high standards of quality in the data that we collect and consistency among observers. If you have any questions about what is written here, please do not hesitate to contact me (Jeff Heys).

The protocol itself is a GPS-based method to map exotic plant infestations and uninfested areas and collect relevant information about them. The data will become part of a database that spans multiple years of data collection from across the Alaska Region of the NPS. It will also be incorporated into a statewide database that has been developed to track exotic plant distributions across jurisdictional boundaries.

Data Dictionary

To begin with, this protocol does not provide instructions on the operation of Trimble GPS units. There are several units that can be used which have different organization and screen display information. This piece of the protocol should be addressed through Trimble training provided by Joel Cusick (907-644-3549). The binder provided for the class should be thoroughly reviewed by those not participating in this year's training. With that, let's jump right into the data dictionary that lies at the heart of our data collection.

Point, Line, or Polygons?

When you walk up to an infestation of exotic plants, the first question to ask yourself is: can this patch be best represented as a point, a line, or a polygon? Because all patches take up 2-dimensional space, they are all actually polygons. But using GPS units to map exact polygons takes a good deal of time, and so we sometimes save time by mapping them as points or lines and using a certain "buffer distance" that the plants extend from the point or line.

Points

- Use points on very small patch of plants in a circular shape. Use a "buffer distance" around the radius of the circle to capture the size of the patch.

Lines

- Use a line to represent a long string of plants along a roadside. Apply a "buffer distance" equal to half the width of the linear patch.

Polygons

- Actual polygons are best used to map large or irregular shapes that are not well-represented by points or lines. They can also be used to map infestations of particular concern, in order to provide sufficient precision to be able to document short-term changes in patch shape.

GPS settings

Four files must be initially transferred to the Trimble unit using the Data Transfer utility in Pathfinder Office.

- Make sure that the “Send” tab is showing, click on “Add”, and you will see the four file types we need to transfer:
 1. Data File _04data_PARK.imp
 2. Data Dictionary 05_AKEPMT.ddf
 3. Configuration Summer_05.tcf
 4. Coordinate System Export File AK_3-00.CSW
- Add these to the list and then tap on “Transfer All”
- When the “Associated Files” dialog box appears, check all the boxes and click OK.
- Answer “Yes” to the two dialog boxes that follow regarding file sizes and replacement of coordinate systems on the unit

Go to the “Start” menu of the Trimble unit

- tap on “Settings”
- on the “System” tab, tap on “Clock”
- verify that the time zone is set to “**GMT-9 Alaska**” and tap OK.

To standardize our Trimble units for data collection, we are using a configuration file that sets the most important GPS settings to predetermined values.

- Open up TerraSync on the unit (tap F1)
- select “Setup” from the main menu.
- below the “Current Configuration:” box, tap on the box labeled “Change”
- select “Summer_05” from the menu and tap on “Load”
- set the antenna height just below your own height in meters
- tap on the “Logging Settings” box
- for “Filename Prefix”, change the ‘R’ to the first letter of your last name

General Tips

- While recording a feature, hold the unit head-high and away from your body so that it can “see” more sky.
- Remember that you can always press “Pause” to temporarily stop the recording of positions while the feature is still open.

- The logging interval (how often the unit records a position within a feature) has been set in the data dictionary to one second for points and five seconds for lines.
- We recommend recording at least ten positions for points and enough positions for lines to delineate the shape (more around the corners and curves, less for straight lines).
- For the integrity of the data, it's a good idea to begin a new rover file every few hours rather than using the same one all day.

Data Fields

You may use the Data Dictionary editor utility in Pathfinder Office to arrange the data collection format for your own convenience:

- Please do not remove or add attribute values or data fields.
- Note that any field you alter as described below must be altered in all three feature classes (Pnt2Buf, Line2Buf, and Poly).
 - An easy way to do this is by copying the data field you've altered (ctrl+c),
 - Pasting it into the other feature classes (ctrl+v),
 - And then deleting the duplicate unaltered field it replaces (Delete key).
- Arrange the order of attribute values using the up and down arrows so that the ones you use most commonly are at the top of each list.
 - Set the values that you use for most records as defaults.
 - Save the modified file with your initials (e.g., 05_AKEPMT_JAH.ddf).

LocationID	This is the general area where the activity takes place, with several possible in each park unit. For a description of each area, please see the LocationID table below. Note that a single LocationID must be either inside or outside of the park boundary; please pay careful attention to this in choosing the appropriate one. You should certainly arrange these in the order of your most common usage.
Dstrbncs	Because most of Alaska's exotic plants grow only on disturbed sites, we are tracking what disturbance types are being invaded by what species in NPS units. The options are listed in the Disturbance Type table below. The most frequently applicable type is fill importation, which includes roadsides and construction sites.
LctnDscript	The location description is an opportunity for you to delineate in words the exact location, as well as any information about that location that might be important. The first provision should enable someone who looks at a table of your data to understand where within the LocationID the work took place without having to use GIS. Please take the time while editing to be complete and also try to be concise. The second provision should note if there is special significance in the location, such as remoteness, proximity to a stream or river, or potential to be easily spread into other areas.
BufferM	This is the buffer distance in meters that will be used to convert points and lines into polygons. If you imagine the shape you'll be creating, the buffer distance should extend the point or line to the boundary of the infestation at its maximum distance from the center point or line. The buffer distance will therefore be half the width of a linear shape or the radius of a circle around a point. The GPS unit can also offset a line so that you may walk the edge of a linear infestation, offset the line to the middle of the infestation, and assign a buffer distance

	according to its width. The buffer for uninfested roads and trails should generally be 5 meters, measured from the centerline of a trail or the barren edge of a road.
Taxon	This is the dominant exotic plant species of a particular infestation. All species that have been reported from Alaska NPS units are on this list. If the species of concern does not appear on the list or you are uncertain of its identity, enter "Other" and note the species or uncertainty in the Remarks field. If the mapped area is free of exotic plants, enter "None".
Phenology	The phenology of the dominant exotic species is especially important for control timing and future planning. These are quite simple, with options of "rosette", "no_flower", "full_flower", "in_seed", and "stand_dead" (standing dead). If there are no exotics present, enter "none",
CvrClsPerG	The cover class percentage of the dominant exotic species is a critical measure of an infestation's density. Imagine yourself suspended directly above the polygon you are mapping, including the buffer applied to points and lines. The value you enter is the percentage of the entire area that is covered from this angle by the material of the exotic species, with options of 1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, and 100. This is much easier to do with small areas than with large ones, so please start by practicing with small patches and be conservative with your estimates (i.e., underestimate rather than overestimate). Note that there is a correlation between this value and the buffer distance or size of a polygon: as the buffer distance increases for a particular group of plants, their percent cover of the total area decreases. Do not worry if most of the time the value entered is 1, for this is common with the small and disperse plant populations we are dealing with. It is more important to record the true extent of an infestation than to demonstrate that an infestation is relatively dense.
Action	Inventory is the first documentation of a particular infestation, whereas Monitoring is a follow-up visit to a previously inventoried site from 2005 or previous years. Similarly, Treatment is the first control effort for a particular infestation, whereas Retreatment applies to any subsequent control efforts.
Treatment	The only two treatment types you will be using are "PULL/DIG-MANUAL" and "CUT". If the infestation is not being controlled, enter "NONE". If you only treat part of the infestation, deal with the untreated and the treated sections separately. Map them both.
CntrlEffrt	For planning and evaluation, it is helpful to have a relative indicator of the control effort required for a particular infestation. This can be projected if the infestation is not controlled or actual if it is. To standardize, "low" refers to an infestation that could be manually controlled by one person in less than an hour. "Medium" infestations could be controlled by one person in less than an 8-hr. day. "High" infestations would require multiple people or multiple days to control.
Undetermined	This is a stem count of the dominant exotic species. Please only enter a value when you are certain that you can provide a relatively accurate count of individual plants. If the action is a control event, this is much easier to ensure, for each person involved can count the number of plants he or she controls. If the action is not a control event, please do not record a value over 100 unless you have carefully counted the plants. You will find during control that there are almost always more plants than you saw at first.

Remarks	This is a free-for-all for you to convey anything that seems important about an infestation or uninfested area, such as: control might not work for a particular reason; species' identity is uncertain or not listed in the species list; components of the native plant community; potential for spread if left untreated; data collection is incomplete; where to look if hidden; invading undisturbed plant community; apparent source of infestation; similar native species in the same area; need for monitoring, etc.
StartDate, StartTime	Don't worry about these fields, because the unit creates them automatically for each feature recorded.
AssocPark	Associated park is the four-letter code for whatever park unit you're working in, which should be set as the default value.
InPark	If the area mapped is located on park land, enter "yes"; if it lies outside of the park boundary or on inholdings, enter "no".
Recorder	These are the initials of the person using the Trimble unit. Set your initials as the default value.
Team	If you are performing the activity in question alone or with help, enter "AKEPMT". If you are recording the accomplishment of volunteers, enter "Volunteer", or of other NPS personnel, enter "Other".
Taxon2, Taxon3... Phenology2, Phenology3... CvrClssPerG2, CvrClssPerG3... Undetermined2, Undetermined3...	We have provided an additional 4 fields for 4 exotic species other than the dominant species at a particular site. In general, we prefer that you record each species individually with its own shape rather than use these additional fields. This option is provided to save you time when there is a whole complement of species infesting the same area and you don't have time to map them individually. Remember that if the extents of each species are not the same, this option should not be used. For each additional species, you must also enter the phenology, cover class, and stem count (see above) using additional fields provided.
SiteID, RoverFile	Don't worry about these automatically generated fields.

LocationID	Park	InPark	Location Description
serpentine_springs	BELA	yes	Serpentine Hot Springs and ATV trails radiating out from there
dmts_rd	CAKR	yes	road from Red Dog Mine to port
kakagrak_hills	CAKR	yes	abandoned military base and airstrip
kotzebue	CAKR	no	Kotzebue and surroundings
first_mile	DENA	yes	park road from the entrance to headquarters, including headquarters
kantishna	DENA	no	inholdings at the end of the park road
mckinley_village	DENA	no	development along Parks Highway outside the boundary
nenana_river	DENA	yes	banks of the Nenana River
park_rd	DENA	yes	park road between headquarters and Kantishna
parks_hwy	DENA	yes	Parks Highway along boundary
kuyuktuvuk	GAAR	yes	Kuyuktuvuk watershed and Oolah Pass
bartlett_cove	GLBA	yes	frontcountry Glacier Bay
beardslees	GLBA	yes	Beardslee Islands

dry_bay	GLBA	yes	Dry Bay and vicinity
east_arm	GLBA	yes	coastline of the East Arm of Glacier Bay
gustavus	GLBA	no	Gustavus and surroundings
main_bay	GLBA	yes	the portion of Glacier Bay to the south of the two arms
west_arm	GLBA	yes	coastline of the West Arm of Glacier Bay
king_salmon	KATM	no	King Salmon and surroundings
lake_camp	KATM	yes	Lake Camp road and Pike's Ridge trail
brooks_camp	KATM	yes	Brooks Camp and surroundings
10000_smakes_rd	KATM	yes	road to the Valley of 10,000 Smokes
katm_outer_coast	KATM	yes	anywhere along the Katmai coastline
port_alsworth_town	LACL	no	the private lands of Port Alsworth
port_alsworth_nps	LACL	yes	parklands in Port Alsworth and surroundings
twin_lakes	LACL	yes	the Twin Lakes area
lacl_outer_coast	LACL	yes	anywhere along the Lake Clark coastline
exit_glacier	KEFJ	yes	Exit Glacier Road and associated development and trails
kefj_outer_coast	KEFJ	yes	anywhere along the Kenai Fjords coastline
seward	KEFJ	no	Seward and surroundings
chilkoot_trail	KLGO	yes	the Chilkoot Trail Unit
dyea	KLGO	yes	Dyea
skagway	KLGO	no	Skagway and surroundings
white_pass	KLGO	yes	the White Pass Unit
chitina	WRST	no	Chitina and surroundings
kennicott	WRST	yes	Kennicott (Town and Mine Site), Bonanza Ridge and Root Glacier Trails
may_creek	WRST	yes	NPS compound, airstrip, and surrounding roads and trails
mccarthy	WRST	no	McCarthy and surroundings
mccarthy_rd	WRST	yes	region from Copper River bridge to Kennicott River plus ATV trails
nabesna_rd	WRST	yes	Nabesna Road and ATV trails
remote_airstrip	WRST	yes	Peavine, Huberts, Tana, Jake's, C-N confluence, Chisana so far
slana	WRST	no	area outside of the park at the entrance to the Nabesna Road
viscenter	WRST	yes	headquarters and visitor center complex
coal_creek	YUCH	yes	Coal Creek watershed including road to Woodchopper Creek

Disturbance Type	Disturbance Description
ABDHOME	Abandoned Homesite
ANIMAL	Animal Related Disturbed Site
BRSHCUT	Mechanical Brush/Tree Cutting

COASTAL	Coastal/Beach
FLIMPRT	Fill Importation (e.g. Road or Railroad)
GLACIER	Glaciation
GRAZING	Grazing
HRBCIDE	Herbicide Application
LOGGING	Logging
MATEXTR	Material Extraction (e.g. Quarry)
MINING	Mining
MOWING	Mowing
ORVDST	ORV Disturbance
OTHER	Other Mechanical Substrate Alteration
PLOWING	Plowing
RIVER	River Action
SLIDE	Landslide/Avalanche
STREAM	Stream Action
THERMAL	Thermal Disturbance
TRMPLNG	Trampling
VOLCANO	Volcanic Action
WIND	Wind Disturbance/Erosion
WLDFIRE	Wildfire
WNDTHRW	Windthrow

Monitoring

All control sites from 2004 should be monitored and retreated this summer. The reason for this is that we are in the beginning stages of exotic plant management in Alaska's NPS units, and we need to know what is working and what is not. Beyond this, it is generally recommended for any exotic plant control that the site be monitored into the future, because there may still be a seedbank in the soil or plants may resprout. For control sites where there are exotic plants present upon return, control the site again and plan to return within a month or so to evaluate the effectiveness. **HOW TO NAVIGATE to LAST YEAR'S CONTROL SITES**

Keeping Track of your Hours

All of our data must be entered into a nationwide database (APCAM – the Alien Plant Control and Monitoring database) that requires very specific information about the amount of time spent and people involved in every activity we perform, not only in the field but also in the office. Last year, each employee was individually responsible for entering the data he or she collected into APCAM, but this proved to be extremely problematic due to the complicated database hierarchy. The result was considerable confusion and variable data entry methodologies.

To avoid these problems in 2005, we at the Regional Office (Penny and I) will perform all APCAM data entry for the data that you collect. Please realize that this is a major burden that you will not have to bear. In order for this to happen, on the other hand, we will require very specific information on the time you spend on individual activities on a daily basis from the moment you read this protocol until the last day you work for the EPMT in 2005. I know that this seems extreme, but there is no other way to satisfy the database requirements and minimize database angst.

First, begin an Excel spreadsheet (e.g., GAAR_time_record.xls) with three columns – date, time period, personnel, and activity. You will work off this spreadsheet the entire season to keep track of your time.

- At the end of each day, make a log of what happened.
- Activities that should be accounted for include:
 - Preparation
 - Travel
 - Inventory
 - Control
 - Monitoring
 - Restoration
 - Education
 - data management
 - planning
 - As with all important files, back this one up on a regular basis.

Here's an example of a hypothetical 2-day trip for Penny (PSB) and I (JAH) to Denali:

Date	Time Period	Activity	Personnel
6/14/05	0700-0800	Preparation for Parks Highway control event	JAH & PSB
	0800-1200	Travel from Anchorage to DENA	JAH & PSB
	1230-1330	Inventory of several <i>Melilotus</i> infestations	JAH & PSB
	1330-1400	Education and orientation for volunteer group	JAH & PSB
	1400-1700	<i>Melilotus</i> control event	JAH, PSB, & 6 volunteers
6/15/05	0800-0900	Meeting with park staff	JAH
	0800-1000	Monitoring of 2004 control sites	PSB
	0900-1000	<i>Vicia</i> control with park staff	JAH & 3 park staff
	1000-1200	Data management, upload/editing	JAH & PSB
	1300-1700	Travel from DENA to Anchorage	JAH & PSB

Photo Management

Photos are an excellent tool for exotic plant management, not only to document infestations and sites for our own internal purposes, but also to convey to others what we're dealing with and what we have accomplished. Several excellent photo opportunities include:

- Before and after photos of infestations that are controlled
- Volunteer events – work in action
- New or uncertain species, range expansions, or particularly nasty infestations
- Close-ups of particular species to aid in identification
- Restored plant communities
- Educational events
- Yourselfes and others working with exotic plants

That said, we can only use these photos later on if we keep them organized and collect relevant information about them.

Documenting Photos

- For photos of anything on the ground, please collect a “Photo_pt” feature using your Trimble unit at the spot where you are standing when taking the photo.
- Include with the feature enough information to enable anyone to determine what the photo should display.
- Keep track of the photo number or name and include this information in the Trimble unit under the “Photo_pt” feature.

Managing Photos

We recommend that you manage your photos – meaning upload, rename, and organize – on a daily basis, preferably at the same time that you're editing your spatial data in Pathfinder Office.

- Step through the “Photo_pt” features with a image browser window open at the same time and ensure that they are linked, i.e. the rover file of “Photo_pt” features can be used to find the photo for which the point was recorded.
- Watermark the date and time on the photo. Make sure that the date and time on the camera aligns with that of the Trimble unit.
- Resolution should be as high as reasonable given memory constraints, with the optimal filesize (for a .jpg) being greater than 500 KB per photo.

Including Information about Photos

- Right-click on the photo point file and click on Properties.
 - On the Summary tab, there are several fields that can be filled in so that we know what the photo is, where it is, and who took it.

- At the end of the season, I will ask you to send me whatever photos you have that are connected to “Photo_pts”, as well as any that you think may be valuable for this program in the future.

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File Management

All data that you collect this summer will be processed using Pathfinder Office software, Trimble’s desktop data management software.

- First create a new project for your park using the four-letter code, which will automatically be stored in your C:\PfData directory (e.g., C:\PfData\GAAR – hereafter referred to as the project folder).
 - Transfer your rover files (.ssf) from the GPS unit to this folder as soon as possible after data collection.
 - Back up your rover files immediately in the project Backup folder.
 - Connect to the internet, differentially correct each rover file and save the output corrected files (.cor) in the project folder and Backup folder as well.

Editing Files

In order to ensure high data quality, please review and edit every rover file within a few days of the data collection. Editing involves two components:

- Check the validity of positions, once differentially corrected, to make sure they match what you recorded in the field.
- Review the attributes attached to those features to check that the information is accurate and complete.
 - Elaborate on location descriptions or comments and eliminate any bad data.
 - Please take the necessary time to make your data as finished as possible, for these will be transformed into GIS data at the end of the season for anyone to peruse.

Managing Edited Files

- Create a new folder in the project folder called Final_Edits
 - Once you begin editing a file, save it in Final_Edits as edited_filename.cor (e.g. edited_H050617A.cor).
 - In the same folder, create a status spreadsheet (in Excel, e.g., GAAR_rover_file_status.xls) to keep track of which files still need to be edited
 - List any issues, deviations from the protocol, or field notes you had for each rover file.
 - Periodically burn a CD of the project folder and upload all rover files (.ssf, .cor, and edited.cor) to the W:\ARO\NaturalResources\EPMT folder.
 - Here, you’ll find a data repository folder for your park unit.
 - More frequently, copy the Final_Edits files into the project Backup folder.

- Once you have finished editing a file, you are done with it until the end of the season.
- Once all edited files are complete, let us know and we will transform them into GIS files to ensure consistency among park units and send them back to you for your reference in preparing the seasonal report.

Voucher Specimens

In order to back up our observations of plants in the field, voucher specimens should be collected under certain circumstances:

- Any species previously unrecorded in a park unit must be collected.
- Any species that you cannot positively identify must be collected.
- Any species with a significant range expansion or found in remote areas should be collected, with priority given to species of greater concern.

All parts of the plant should be represented, including roots and flowers or fruits, and should be preserved using a plant press or heavy books with newspaper. Please review the University of Alaska Museum's collection recommendations (<http://www.uaf.edu/museum/herb/howtocoll.html>).

We have set up an agreement with the University of Alaska Natural Heritage Program in Anchorage to not only assist us with the identification of species but also to prepare herbarium specimens (mounted on paper and with proper labeling) of any plants we collect in the field. A photo should be taken of the whole plant prior to collection, and a "Photo_pt" should be collected to document its location. Several pieces of information must be collected any time that a plant is collected and can be entered as "comments" for the GPS feature:

- General and specific locality (e.g. Parks Highway, 5.5 miles north of Willow, east side of road, 2 meters from the edge of the pavement)
- General and specific habitat (e.g. roadside adjacent to broadleaf forest, growing among yarrow, bluejoint grass, and fireweed)
- Elevation (can be determined later based on GPS location)
- Date of collection
- Collected by whom

Additional information may include exposure (N, S, E, W), slope angle (flat, gentle, steep), soil texture (gravel, sand, loam) and moisture (wet, moist, dry), flower color (some blossoms fade with drying, some colors intensify), odor, relative abundance (abundant, common, infrequent, rare), or conspicuous use by animals. **What should they do with the plants?**

Seasonal Report

The seasonal report for your park is your chance to summarize what you've learned and accomplished with regard to exotic plant management. These are immensely valuable for record-keeping and future planning, and it will also demonstrate to your supervisor the quality of your work. There is no page limit for this, because it's more important that you get across what you did and found this summer, no matter the length. Please be as thorough as possible with this. Templates from past seasonal reports are available and will be sent out at the end of the season.

Items to be covered in the report:

- Accomplishments (Prevention, Detection, Inventory, Control, Monitoring, Restoration, Education, Contacts, etc.)
- Summarize 2005 exotic plant distribution (diversity and relative species abundance in frontcountry and backcountry) in comparison to what you know of results from previous years. Highlight any new species or situations of particular concern.
- Recommendations for next year are your chance to improve what we do.
- Anything else you think is important

As far as timing goes, the data process must be complete by Sept. 1 at the latest and preferably earlier so that we can troubleshoot any problems or inconsistencies that arise. We would prefer to have the reports in hand by Sept. 15th, but if that presents a problem for you, let us know. In any event, if you have any questions or issues, give us a call. We will be traveling around the state for much of the summer, but we will be checking messages periodically and you guys are our top priority.

Thank you for your participation this summer!! We hope that you are interested in continuing to work with the Alaska Exotic Plant Management Team in the future.